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ON FINGER MUSCLES IN MEGAPTERA LONGIMANA AND IN OTHER WHALES.[1]

BY JOHN STRUTHERS, M.D.

THE author's observation, showing the presence of finger muscles in Megaptera, was made on the individual beached at Stonehaven, near Aberdeen, on January 8, 1884, the description of the rudimentary hind limbs of which he had described at the meeting of the British Association at Montreal. The presence of muscles in the forearm of a whale had been first noticed by Flower (in *Balænoptera musculus*) in 1865, and described in the lesser fin-whale (*B. rostrata*) by Carte and Macalister in 1868, and by Perrin in 1870. The author had described these muscles in the *Journal of Anatomy and Physiology*, in *B. musculus*, in 1871; in *Hyperoödon bidens* in 1871 and 1873, and in the Greenland right whale, *Balæna mysticetis* in 1878. In *B. musculus* the muscles present were the flexor carpi ulnaris, flexor digitorum ulnaris, flexor digitorum radialis, and an extensor communis digitorum. *Hyperoödon bidens* is the first and as yet only toothed whale in which they have been found, except in the common porpoise, in which he found the flexor carpi ulnaris present. In Hyperoödon the extensor was divided into two, and much more developed than in *B. musculus*. In the Greenland right whale he found also an extensor carpi ulnaris and a flexor carpi radialis. In the narwhal, Beluga and common pilot whale (*Globicephalus melas*) he found these muscles to be present morphologically, but histologically represented by fibrous tissue and therefore reduced to the condition of ligaments.

Considering the enormous size of the pectoral fin in *Megaptera longimana*, he had been anxious to ascertain whether these finger muscles were present, and if so, whether they were more developed than in other finners, or more rudimentary. He found the same flexor muscles present as in *B. musculus*, but the two flexor muscles of the fingers, instead of being larger were together not half so large as in *B. musculus*. Also that the proportions of these two muscles were reversed, the ulnar flexor being about one-third the size of the radial flexor, instead of larger than it, as in *B. musculus*. The extensor aspect of the limb was not yet dissected, as he had had time just to examine the flexor aspect before

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[2] Read before the American Association at Philadelphia, on Sept. 9.

leaving for Canada. The dissection of whales is no easy matter.

Here then we have these finger muscles in Megaptera not more developed in proportion to the size of the limb, but in a still more rudimentary condition. These facts, the author observed, could be reasonably explained only on the hypothesis of the descent of whales from some ancestor in which the fingers had more extensive movement.

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THE STRUCTURE AND DEVELOPMENT OF THE SUSPENSORY LIGAMENT OF THE FETLOCK IN THE HORSE, OX, &c.[1]

BY J. D. CUNNINGHAM, M.D.

THE author first alluded to the various examples which are found amongst the mammalian group of muscles becoming transformed into fibrous tissue and assuming the duties of ligaments. He had observed muscles thus metamorphosed in the foot of the pig, walrus, armadillo, elephant, &c., and Professor Struthers had, in a paper read before the British Association in Montreal, instanced a remarkable case in which a muscle in the rudimentary hind limb of a cetacean was completely converted into ligamentous tissue around its periphery whilst it remained muscular in its center.

The most remarkable examples of this muscle metamorphosis are to be found in the feet of the horse and ruminants. The suspensory ligament of the fetlock, as is well known, is muscular in its origin, and in every case its ancestry can be traced with the greatest clearness and precision. In the horse it is derived from the fibrous transformation of the two bellies of the flexor brevis medii, and if transverse sections are made of the ligament, the remains of these bellies may be observed in its midst in the form of two crescentic fleshy outlines placed side by side. Every here and there, however, the outlines are interrupted by patches of fat cells and degenerating muscular fibers. The suspensory ligament of the ox, sheep, &c., is derived from the fusion and fibrous transformation of the four fleshy bellies of the flexor brevis annularis and flexor brevis medii, and in transverse section these show as

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[1] Abstract of a paper read before the biological section of the American Association for the Advancement of Science, in Philadelphia, 1884.